



VLF lightning noise tracks the solar rotation

Yuval Reuveni and Colin Price

Tel Aviv University, Department of Geophysics and Planetary Science, Tel Aviv, Israel (cprice@flash.tau.ac.il, +972 3 640.9282)

Lightning is the major source of VLF radiation in the atmosphere. From long term measurements of natural VLF radiation, we have discovered that at frequencies close to the Earth-ionosphere cutoff frequency (~ 2 KHz), the VLF "noise" shows a clear 27-day periodicity. Furthermore, the 27-day modulation is detected only during daylight hours, implying that this is not the lightning activity itself that is changing, but rather the waveguide parameters, that are sensitive to changing solar radiation. Although this 27-day period is quite fundamental to our Sun, it is only partially observable via the typical solar parameters such as sun spot number, Lyman alpha radiation and 10.7cm radio flux. We propose that continuous monitoring of broadband VLF radio noise may provide a new method for monitoring changes in the solar rotation rate.